

KAY BROTHERS
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EXPERIENCE:

5/10 – Present **CONSULTANT TO THE SOUTHERN NEVADA WATER AUTHORITY**

Responsibilities include providing experience and historical perspective related to major Authority projects and initiatives. The majority of time is spent working with staff and other consultants on the Groundwater Development Project.

4/02 – 5/10 **SOUTHERN NEVADA WATER AUTHORITY**
Deputy General Manager – Engineering and Operations, Las Vegas, NV

The Southern Nevada Water Authority (Authority) is the regional drinking water provider for the Las Vegas Valley. The Authority's regional responsibilities include treating and distributing drinking water, building and maintaining regional infrastructure, developing new supplies, and implementing regional conservation programs. The DGM of Engineering and Operations was responsible for five departments listed below which included over 400 people. Responsibilities also included representing the Authority at national and international water symposiums, dealing with various federal agencies including the Department of the Interior Bureaus, and participated in various forums that involved the Colorado Rivers' Seven Basin States' representatives.

Southern Nevada Water System (SNWS) Operations treats and distributes Colorado River water from Lake Mead to the cities of Las Vegas, North Las Vegas, Henderson, Boulder City and unincorporated Clark County. SNWS includes two state of the art water treatment plants, Alfred Merritt Smith with a capacity of 600 million gallons per day (MGD) and River Mountains with a capacity of 300 MGD.

The Engineering Department designs and constructs regional facilities as specified in the Authority's three billion dollar Capital Improvement Plan (CIP), the one billion dollar Major Capital and Construction Plan (MCCP), and the 100 million dollar Las Vegas Wash Capital Improvement Plan. The most recent addition to the CIP was the Authority's project to install a third intake and tunnel in Lake Mead to ensure pumping capacity at lower Lake Mead levels resulting from drought.

The Surface Water Resources Department prepares the Authority's annual Water Resource Plan that evaluates demand over the next 50 years and specifies the various resources that will be available to meet those demands. Specific activities include acquisition, development, accounting, and management of the Colorado, Virgin, and Muddy Rivers' resources as well as groundwater imported from Coyote Spring Valley.

The Groundwater Resources Department provides the technical support for development and management of regional groundwater resources. The Clark, Lincoln, and White Pine Groundwater Development Project is estimated to produce between 125,000 and 165,000 acre feet per year of groundwater resources from eastern and central Nevada and cost 3.5 billion dollars to construct.

The Environmental Resources Department develops programs for water conservation (including drought plans), sustainability, climate change, and the environmental management of the Authority's northern resources including ranch and grazing properties. The Authority's Water Smart Landscaping Program is nearing the \$100 million milestone for payments for removing turf.

8/95 – 4/02 **SOUTHERN NEVADA WATER AUTHORITY**
Director of Resources, Las Vegas, NV

Managed the Resource Department, which included two technical Divisions: Resource Planning and Environmental Planning. The Resources Department was responsible for the assessment and evaluation of all regional water resources issues, including Colorado River water. One major accomplishment was the negotiation of the Arizona Banking Agreement ensuring future water resources for the Authority.

6/86 - 8/95 **LAS VEGAS VALLEY WATER DISTRICT**
Sr. Hydrologist, Las Vegas, NV

Supervised hydrologists and GIS technicians working on the development of ground- and surface-water resources in eastern and central Nevada, known as the Cooperative Water Project (CWP).

10/84 - 6/86 **CLARK COUNTY DEPARTMENT OF COMPREHENSIVE PLANNING**
Principal Planner, Las Vegas, NV

1/80 - 10/84 **KERR - McGEE CORPORATION**
Quality Control Supervisor: Henderson, NV
Environmental Engineering Coordinator: Oklahoma City, OK

6/77 - 10/80 **PHILLIPS PETROLEUM COMPANY**
Environmental Engineer

EDUCATION:

B.S. Environmental Engineering, New Mexico Institute of Mining and Technology
May 1977. Graduated in top 5% of Class - Designated Tech Scholar

REFERENCES:

Terry L. Katzer, Consulting Hydrologist
Cordillerian Hydrologic, Inc.
(702) 853-7409

Patricia Mulroy, General Manager
Southern Nevada Water Authority
(702) 258-3104

David A. Donnelly, Consultant
(702) 499-8651

BIBLIOGRAPHY:

- Katzer, Terry, Brothers, Kay, and Dixon, Gary, 1987, **The quest for ground water in an arid environment**: Geological Society of America, Cordilleran Section, Abstracts with program, V.20, No. 3, p. 172
- Brothers, Kay, and Katzer, Terry, 1988, **Artificial recharge through public supply wells, Las Vegas Valley, Clark County, Nevada**: International Symposium on Class V Injection Well Technology, September 13-15, 1988, Las Vegas, Nevada
- Brothers, Kay, and Katzer, Terry, 1988, **Ground-water chemistry changes resulting from stressed aquifer systems in Las Vegas Valley, Clark County, Nevada**: Nevada Department of Conservation and Natural Resources, (in press), 66 p.
- Katzer, Terry, and Brothers, Kay, 1988, **Water conservation, myth or mandate, an arid southwest perspective**: American Water Resources Association, Proceedings of the Symposium on Water Data for Water Resource Management, Tucson, Arizona, August 1988, pp 273-281
- Katzer, Terry, and Brothers, Kay, 1989, **Artificial recharge in Las Vegas Valley, Clark County, Nevada**: Journal of Ground Water, January-February, 1989, p. 50-56
- Brothers, K., and Katzer, T., 1989, **Artificial recharge for peak water demands in Las Vegas Valley, Clark County, Nevada**: Proceedings of the 4th Symposium on Artificial Recharge of Groundwater in Arizona, May 23-24, 1989
- Katzer, T., and Brothers, K., 1989, **Perils of progress -- hydrogeological hazards in Las Vegas Valley, Clark County, Nevada**: Proceedings of the American Water Resources Association Arizona Section, Volume 19
- Katzer, T., and Brothers, K., 1990, **Moving toward the millennium**: Proceedings of the Symposium on Hydraulics/Hydrology of Arid Lands -- Int'l. Symposium HY & IR Div./ASCE, San Diego, CA/July 30-August 2, 1990, pp. 124-130
- Brothers, K., and Katzer, T., 1990, **Water banking through artificial recharge, Las Vegas Valley, Clark County, Nevada**: Journal of Hydrology, 115 (1990) 77-103, Elsevier Science Publishers B.V., Amsterdam--Printed in the Netherlands
- Brothers, K., Johnson, M, and Morris, T., 1990, **Hydraulics of artificial recharge through existing production wells, Las Vegas Valley, Clark County, Nevada**: Proceedings in the Third Annual Symposium-Arizona Hydrological Society "Survival in the Desert: Water Quality and Quantity Issues Into the 21st Century", pp. 191-199
- Katzer, T., Brothers, K., Johnson, M., Morris, T., and Bernholtz, A., 1991, **Design and evaluation joint-use wells for water supply and artificial recharge in Las Vegas Valley, Clark County, Nevada**: Presented at AWWA Exposition, Philadelphia, PA, June 24-28, 1991
- Bernholtz, A., Brothers, K., and Katzer, T., 1991, **Analyses of aquifer responses due to continued artificial recharge of treated Colorado River water, Las Vegas Valley, Clark County, Nevada**: Presented at the AIH Annual Meeting "Hydrology & Hydrogeology in the 90s",

November 3-7, 1991, Orlando, Florida

- Katzer, Terry, Brothers, Kay, Johnson, Michael, Bernholtz, Alan, Morris, Tom, and Monaco, Janet, 1992, **Maximizing earth and computer science disciplines for a regional water resource investigation in eastern and southern Nevada**: American Institute of Hydrology Proceedings, Portland, Oregon, October 16-22, 1992.
- Katzer, Terry, and Brothers, Kay, 1992, **Meeting the urban water demands in Nevada, the Las Vegas proposal**: Proceedings of the Rocky Mountain Ground-Water Conference, June 15-17, 1992, Boulder, Colorado.
- Johnson, M.E., Brothers, K., and Katzer, T.L., 1992, **The ultimate water witch: LANDSAT digital imagery of eastern and southern, Nevada**: AWRA 28th Annual Conference Abstract Proceedings, p. 18
- Bernholtz, Alan and Brothers, Kay, 1993, **Changing Colorado River quality and its impact on artificial recharge in Las Vegas Valley, Nevada**: Sixth Biennial Symposium on Artificial Recharge of Groundwater Symposium Proceedings, p. 161-170
- Miller, C.J., Wilson, L.G., Amy, G.L., and Brothers, Kay, 1993, **Fate of organochlorine Compounds During Aquifer Storage and Recovery: The Las Vegas experience**: Journal of Ground Water, Vol. 31, No. 3, May-June 1993, pp. 410-416
- Brothers, Kay, Bernholtz, Alan, and Katzer, Terry, 1994, **Artificial ground-water recharge in Las Vegas Valley, Clark County, Nevada: Model Prediction - "No Cone of Depression Here"**: Published in the Proceedings of the Second International Symposium on Artificial Recharge of Ground Water, July 17-22, 1994 (Orlando, Florida)
- Bernholtz, Alan, Brothers, Kay, and Katzer, Terry, 1994, **Artificial ground-water recharge in Las Vegas Valley, Clark County, Nevada: Storing Today, Treating Tomorrow?**: Published in the Proceedings of the Second International Symposium on Artificial Recharge of Ground Water, July 17-22, 1994 (Orlando, Florida)

Cooperative Water Project Series

- Brothers, K., Tracy, J., Katzer, T., Stock, M. Bentley, C., Zdon, A., and Kepper, J., 1992, **Hydrology and interactive computer modelling of ground and surface water in the Lower Virgin River Valley, primarily in Clark County, Nevada**: Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 1, 90 p.
- Woodward-Clyde Consultants, Dames and Moore, and the Las Vegas Valley Water District, 1992, **Environmental report of the Virgin River water resource development project, Clark County, Nevada**: Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 2, 130 p.
- Brothers, K., Buqo, T., and Tracy, J., 1993, **Hydrology and steady state ground-water model of Coal and Garden Valleys, Lincoln and Nye Counties, Nevada**: Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 8, 52 p.
- Brothers, K., Buqo, T., and Tracy, J., 1993, **Hydrology and steady state ground-water model of Snake Valley, East-Central Nevada, and West-Central Utah**: Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 9, 66 p.

- Brothers, K., Katzer, T., Mojib, R.M., Grinnell, G., Bernholtz, A., and Johnson, M., 1993, **Addendum to hydrology and interactive computer modelling of ground and surface water in the Lower Virgin River Valley, primarily in Clark County, Nevada**: Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 1-A, 35 p.
- Brothers, K., Buqo, T.S., Tracy, J., Kaufmann, R.F., Stock, M., Bently, C., Zdon, A., and Kepper, J., 1993, **Hydrology and steady state ground-water model of Cave Valley, Lincoln and White Pine Counties, Nevada**: Las Vegas Valley Water District, Cooperative Water Project, Series Report No.11, 48p.
- Brothers, K., Buqo, T., Bernholtz A., and Tracy, J., 1994, **Hydrology and steady state ground-water model of Spring Valley, Lincoln and White Pine Counties, Nevada**: Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 13, 69 p.
- Broadbent, R.C., Katzer, T., and Brothers, K., 1995, **Mountain front runoff and ground-water recharge in east central Nevada**: Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 17, 16p
- Brothers, K., Katzer, T., and Johnson, M., 1996, **Hydrology and steady state ground-water model of Dry Lake and Delemar Valleys, Lincoln County, Nevada**: Las Vegas Valley Water District, Cooperative Water Project, Series Report No. 16,48 p.